UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/628,133	07/25/2003	Akishige Yamamoto	04970/000N023-US0	4516

7278 7590 09/07/2005

DARBY & DARBY P.C.
P. O. BOX 5257
NEW YORK, NY 10150-5257

EXAMINER	
FARROKH, HASHEM	

ART UNIT	PAPER NUMBER
2187	

DATE MAILED: 09/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/628,133	YAMAMOTO ET AL.	
	Examiner	Art Unit	
	Hashem Farrokh	2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/25/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

The instant application having application No. 10/628,133 has a total of 4 claims pending in the application; there are 4 independent claims and zero dependent claims, all of which are ready for examination by the examiner.

INFORMATION CONCERNING IDS:

The information disclosure statement (IDS) submitted on 7/25/03 has been considered by the Examiner. The submissions are in compliance with the provisions of 37 CFR 1.97.

INFORMATION CONCERNING CLAIMS:

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> *The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.*

Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

1. *In regard to claim 1, the expressions* "invoking the invoked function" *in line 4 and* "to invoke the invoked function" *in line 13 are unclear. It is difficult to understand what the applicant means by invoking or to invoke a function that is already invoked. A clarification is required.*

2. *In regard to claim 2, the expression* "invokes the invoked function" *in line 4 and* "to invoke the invoked function" *in line 13-14 are unclear. It is difficult to understand*

what the applicant means by invokes or to invoke a function that is already invoked. A clarification is required.

3. *In regard to claim 3, the expression* "invokes the invoked function" *in line 4 and* "to invoke the invoked function" *in line 13 are unclear. It is difficult to understand what the applicant means by invokes or to invoke a function that is already invoked. A clarification is required.*

4. *In regard to claim 4, the expression* "to invoke the invoked function" *in line 5,* "to invoke the invoked function" in line 15, *and* "an invoked function to be invoked" *in line 17 are unclear. It is difficult to understand what the applicant means by to invoke a function that is already invoked. A clarification is required.*

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,530,870 to De Bruler.

5. In regard to claim 1, De Bruler teaches:

"A function execution method **(e.g., see column 3, lines 30-32)** comprising steps of:" "stacking **(e.g., see column 3, lines 39-42)**, in a stack area of a memory **(e.g., see column 6, lines 45-46; element 114 in Fig. 1)**, a function record area according to a format of an invoked function which is invoked by executing an invoking function including a process to invoke another function;" **(e.g., see column 7, lines 215; column 10, lines 64-67; column 10, lines 1-8; Fig. 12).** *For example subprogram in the reference represents function recited in the claim.*

"invoking the invoked function utilizing the stacked function record area;" **(e.g., see column 11, lines 12-24).**

"executing the invoked function which has been invoked;" **(e.g., see column 3, lines 50-54).**

"and then discarding the stacked function record area **(e.g., see column 10, lines 3-6)**, characterized in that an execution format of a first invoking function **(e.g., see column 9, lines 65-66)**, which is obtained by compiling source-codes **(e.g., see column 4, lines 52-58)**, to be executed in the function record area is analyzed and a second invoking function **(e.g., see column 9, lines 65-67)**, which is different from the first invoking function and includes a process of utilizing the function record area to execute the invoking function as an area to invoke the invoked function **(e.g., see column 11, lines 12-16)**, is executed as an alternative function to the first invoking function when it is judged from the analysis that execution results of an invoked function to be invoked by the first invoking function become execution results of the invoking function." **(e.g., see**

column 9, lines 60-67; column 10, lines 1-14; Fig. 11). *For example as shown in Fig. 11, De Bruler teaches a chain subprogram with a first and some immediate and the last subprograms or functions. When the last subprogram is executed the control will be returned to the first calling program that initiated the processes. Thus, bypassing or discarding the return to the intermediate subprogram (e.g., discarding the stack recording area). This would reduce the time used for processing the subprograms and reduces the amount memory usage for stack.*

6. In regard to claim 2, De Bruler teaches:

"A function execution apparatus **(e.g., see column 3, lines 30-32)**, which stacks **(e.g., see column 3, lines 39-42)**, in a stack area of a memory **(e.g., see column 6, lines 45-46; element 114 in Fig. 1)**, a function record area according to a format of an invoked function which is invoked by executing an invoking function including a process to invoke another function **(e.g., see column 7, lines 215; column 9, lines 64-67; column 10, lines 1-8; Fig. 12)**, invokes the invoked function utilizing the stacked function record area **(e.g., see column 11, lines 12-17)**, executes the invoked function which has been invoked and then discards the stacked function record area **(e.g., see column 10, lines 2-6)**, comprising:"

"means for analyzing an execution format of a first invoking function **(e.g., see column 9, lines 65-66)**, which is obtained by compiling source-codes **(e.g., see column 4, lines 52-58)**, to be executed in the function record area;" **(e.g., see column 9, lines 60-67; column 10, lines 1-14; Fig. 11)**

"and means for executing a second invoking function **(e.g., see column 9, lines 65-67)**, which is different from the first invoking function and includes a process of utilizing the function record area to execute the invoking function as an area to invoke the invoked function **(e.g., see column 11, lines 12-16)**, as an alternative function to the first invoking function when it is judged from the analysis that execution results of an invoked function to be invoked by the first invoking function become execution results of the invoking function." **(e.g., see column 9, lines 60-67; column 10, lines 1-14; Fig. 11).**

7. In regard to claim 3, De Bruler teaches:

"A function execution apparatus **(e.g., see column 3, lines 30-32)**, which stacks **(e.g., see column 3, lines 39-42)**, in a stack area of a memory **(e.g., see column 6, lines 45-46; element 114 in Fig. 1)**, a function record area according to a format of an invoked function which is invoked by executing an invoking function including a process to invoke another function **(e.g., see column 7, lines 215; column 9, lines 64-67; column 10, lines 1-8; Fig. 12)**, invokes the invoked function utilizing the stacked function record area **(e.g., see column 11, lines 12-17)**, executes the invoked function which has been invoked and then discards the stacked function record area **(e.g., see column 10, lines 2-6)**, comprising a controller capable of performing operations of:"

"analyzing an execution format of a first invoking function **(e.g., see column 9, lines 60-67; column 10, lines 1-14; Fig. 11)**, which is obtained by compiling source-codes **(e.g., see column 4, lines 52-58)**, to be executed in the function record area;" **(e.g., see column 9, lines 65-67).**

"and executing a second invoking function **(e.g., see column 9, lines 65-67)**, which is different from the first invoking function and includes a process of utilizing the function record area to execute the invoking function as an area to invoke the invoked function **(e.g., see column 11, lines 12-16)**, as an alternative function to the first invoking function when it is judged from the analysis that execution results of an invoked function to be invoked by the first invoking function become execution results of the invoking function." **(e.g., see column 9, lines 60-67; column 10, lines 1-14; Fig. 11).**

8. In regard to claim 4, De Bruler teaches:

"A recorded medium readable by a computer, in which a computer program that causes a computer to stack **(e.g., see column 3, lines 39-42)**, in a stack area of a memory **(e.g., see column 6, lines 45-46; element 114 in Fig. 1)**, a function record area according to a format of an invoked function which is invoked by executing an invoking function including a process to invoke another function **(e.g., see column 7, lines 215; column 9, lines 64-67; column 10, lines 1-8; Fig. 12)**, to invoke the invoked function utilizing the stacked function record area **(e.g., see column 11, lines 12-17)**, to execute the invoked function which has been invoked and then to discard the stacked function record area is recorded **(e.g., see column 10, lines 2-6)**, the computer program comprising:"

"a procedure for causing the computer to analyze an execution format of a first invoking function **(e.g., see column 9, lines 65-67)**, which is obtained by compiling source-

codes **(e.g., see column 4, lines 52-58)**, to be executed in the function record area;" **(e.g., see column 9, lines 65-67).**

"and a procedure for causing the computer to execute a second invoking function **(e.g., see column 9, lines 65-67)**, which is different from the first invoking function and includes a process of utilizing the function record area to execute the invoking function as an area to invoke the invoked function **(e.g., see column 11, lines 12-16)**, as an alternative function to the first invoking function when it is judged from the analysis that execution results of an invoked function to be invoked by the first invoking function become execution results of the invoking function." **(e.g., see column 9, lines 60-67; column 10, lines 1-14; Fig. 11).**

Conclusion

The prior art made of record and not relied upon are as follows:

1. U. S. Patent No. 6,101,326 to Mattson, Jr. describes Method and apparatus for frame elimination for simple procedures with tail calls.

2. U. S. Patent No. 5,590,332 to Baker describes Garbage collection, tail recursion and first-class continuations in stack-oriented languages.

3. U. S. Patent No. 5,335,332 to Christopher, Jr. et al. describes Method and system for stack memory alignment utilizing recursion.

4. U. S. Patent No. 4,530,049 to Zee describes Stack cache with fixed size stack frames.

Any inquiry concerning this communication should be directed to Hashem Farrokh whose telephone number is (571) 272-4193. The examiner can normally be reached Monday-Friday from **8:00 AM to 5:00 PM.**

If attempt to reach the above noted Examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Donald A Sparks, can be reached on (571) 272-4201. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published application may be obtained from either private PAIR or Public PAIR. Status information for unpublished application is available through Private PAIR only. For more information about PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBS) at 866-217-9197 (toll-free).

HF.

HF

2005-08-29

DONALD SPARKS
SUPERVISORY PATENT EXAMINER